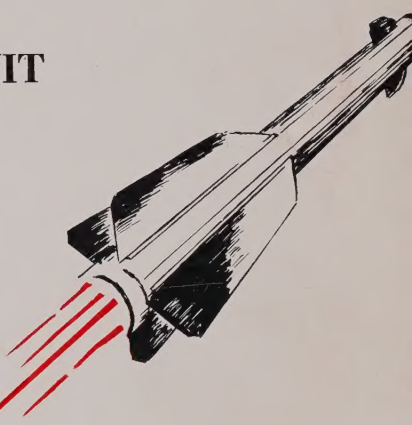
INSTRUCTION BOOK

FOR

REU-300

RANGE EXTENSION UNIT



NEMS • CLARKE CO.

919 JESUP BLAIR DRIVE • SILVER SPRING, MARYLAND

A DIVISION OF Vitro CORPORATION OF AMERICA

INSTRUCTION BOOK

FOR

REU-300

RANGE EXTENSION UNIT

NEMS-CLARKE COMPANY
919 Jesup Blair Drive
SILVER SPRING, MARYLAND
A Division of Vitro Corporation of America

AHF4899021259

WARNING

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised while operating this equipment.

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TABLE 1

PERFORMANCE SPECIFICATIONS

FOR

REU-300

Characteristic	Range	
Tuning Range	250 to 475 mc.	475 to 900 mc.
Noise Figure	10 to 12 db avg.	10 to 12 db avg.
	14 db maximum	14 db maximum
Gain	10 to 12 db avg.	10 db minimum
	8 db minimum	
I.F. Frequency	60 mc.	60 mc.
Input Impedance	50 ohm (Unbalanced)	50 ohm (Unbalanced)
Output Impedance	50 to 75 ohm	50 to 75 ohm
	(Unbalanced)	(Unbalanced)
I.F. Rejection	65 db minimum	60 db minimum
Image Rejection	40 db minimum	40 db minimum
Power Requirements	117/230 VAC	117/230 VAC
	50 to 60 cps	50 to 60 cps
Power Consumption	27 watts	25 watts
Weight	20 lbs.	20 lbs.

TABLE 2

SEMI-CONDUCTOR AND TUBE COMPLEMENT

Symbol	Type	Function
CR-101	1N539	1/4 Bridge Rectifier
CR-102	1N539	1/4 Bridge Rectifier
CR-103	1N539	1/4 Bridge Rectifier
CR-104	1N539	1/4 Bridge Rectifier
CR-105	1N82A	475-900 Mc RF Mixer
V-101	OA2	Voltage Regulator
V-102	6BN4	60 Mc IF Amplifier (475-900 Mc)
V-103	OA2	Voltage Regulator
V-104	Amperite (3-4)	Current Regulator
V-105	6AF4A	Local Oscillator (475-900 Mc)
V-201	5842/417A	First RF Amplifier (250-475 Mc)
V-202	6AK5	Mixer (250-475 Mc)
V-203	6AF4A	Local Oscillator (250-475 Mc)

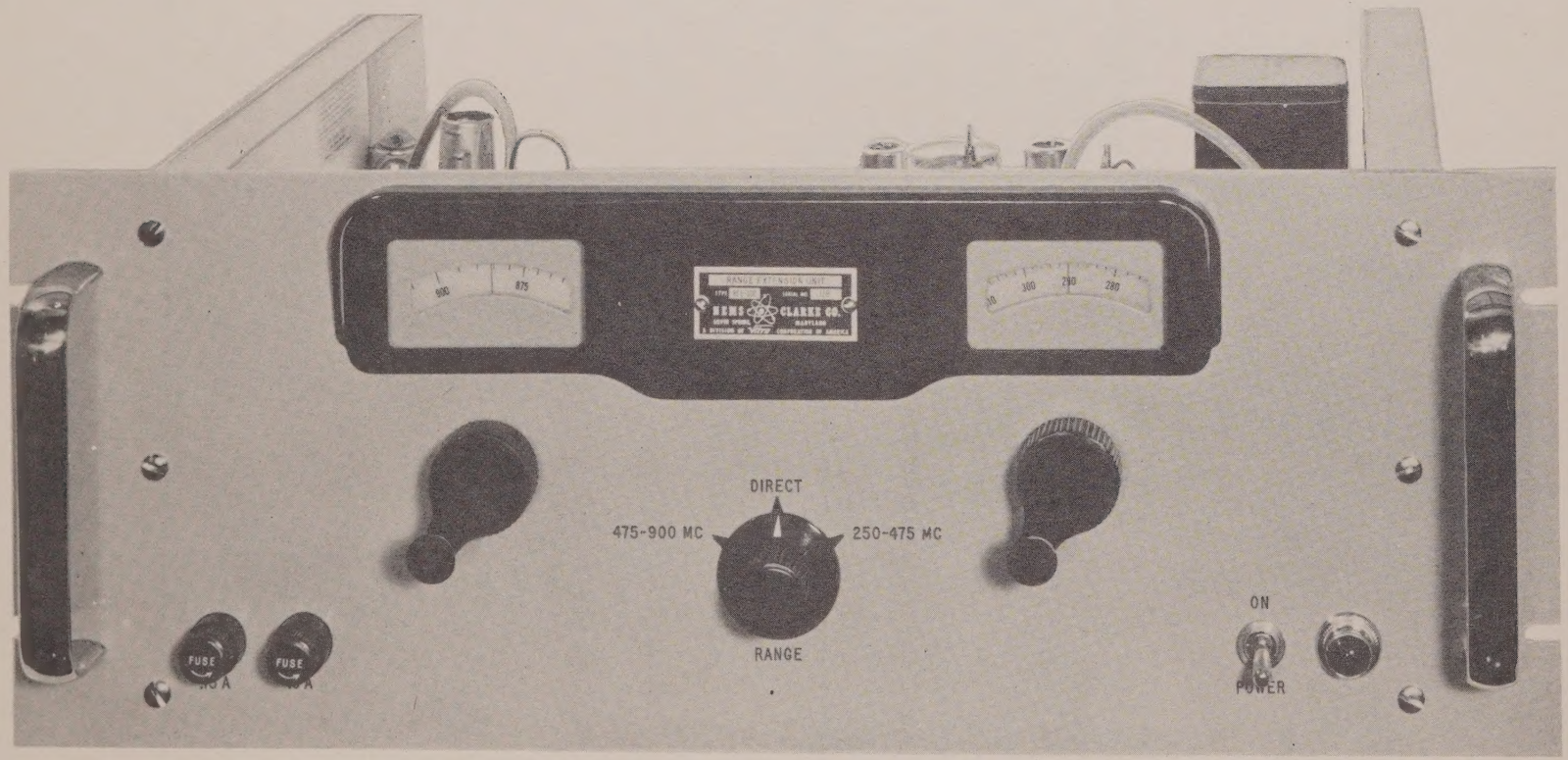


Fig. 1. REU-300 Range Extension Unit, Front View.

SECTION 1

GENERAL DESCRIPTION

1. PURPOSE OF EQUIPMENT.

The REU-300 Range Extension Unit has been specifically designed to extend the operating frequency of the NEMS-CLARKE CO. 55 to 260 mc Special Purpose Receivers to 900 mc. The REU-300 tunes continuously from 250 to 475 mc, and from 475 to 900 mc in two bands and will extend the operating range of a receiver to the latter figure. Thus offering operation in three bands from 55 to 900 mc.

2. DESCRIPTION OF EQUIPMENT.

The front panel controls of the REU-300 consist of the two frequency selection knobs, the two frequency indicating dials, the coaxial "RANGE" switch, S-103, the protective line fuses, F-101 and F-102, the power switch, S-101, and the pilot lamp, I-103. An illuminating lamp is provided, behind each frequency indicating dial, that will light when that particular dial is in use. Neither lamp will light when the coaxial "RANGE" switch is in the "DIRECT" position and normal tuning is accomplished with the tuning dial on the associated receiver.

The REU-300 is designed in such a manner that simply tuning the associated receiver to 60 mc (the IF frequency of the REU-300) and energizing the appropriate section of the REU-300 will provide operation in any of the bands of the REU-300.

The RF sections of the REU-300 are completely shielded subassemblies, featuring great mechanical stability and a high degree of electrical stability. Stenciled terminal boards are used where practical in the main chassis to allow central location of components, and to facilitate identification. The REU-300 is designed to operate in a 50 ohm system, and consists of two separate RF sections, one for use in the 250 to 475 band, and one for use in the 475 to 900 mc band. Application of B plus is discontinued to the RF section that is not in use, and B plus is disconnected from both RF sections when the associated receiver is operated in the 55 to 260 mc band.

The unit measures 7 inches high, by 19 inches wide, by 15 inches deep, and is designed for standard relay rack mounting. The weight of the unit is approximately 20 lbs; when packed and ready for shipment, the unit weighs approximately 35 lbs. The front panel is finished in hard finished blue-gray enamel. Figure 1 shows a front view of the REU-300 Range Extension Unit, Table 1 shows the Performance Specifications and Tube Complement.

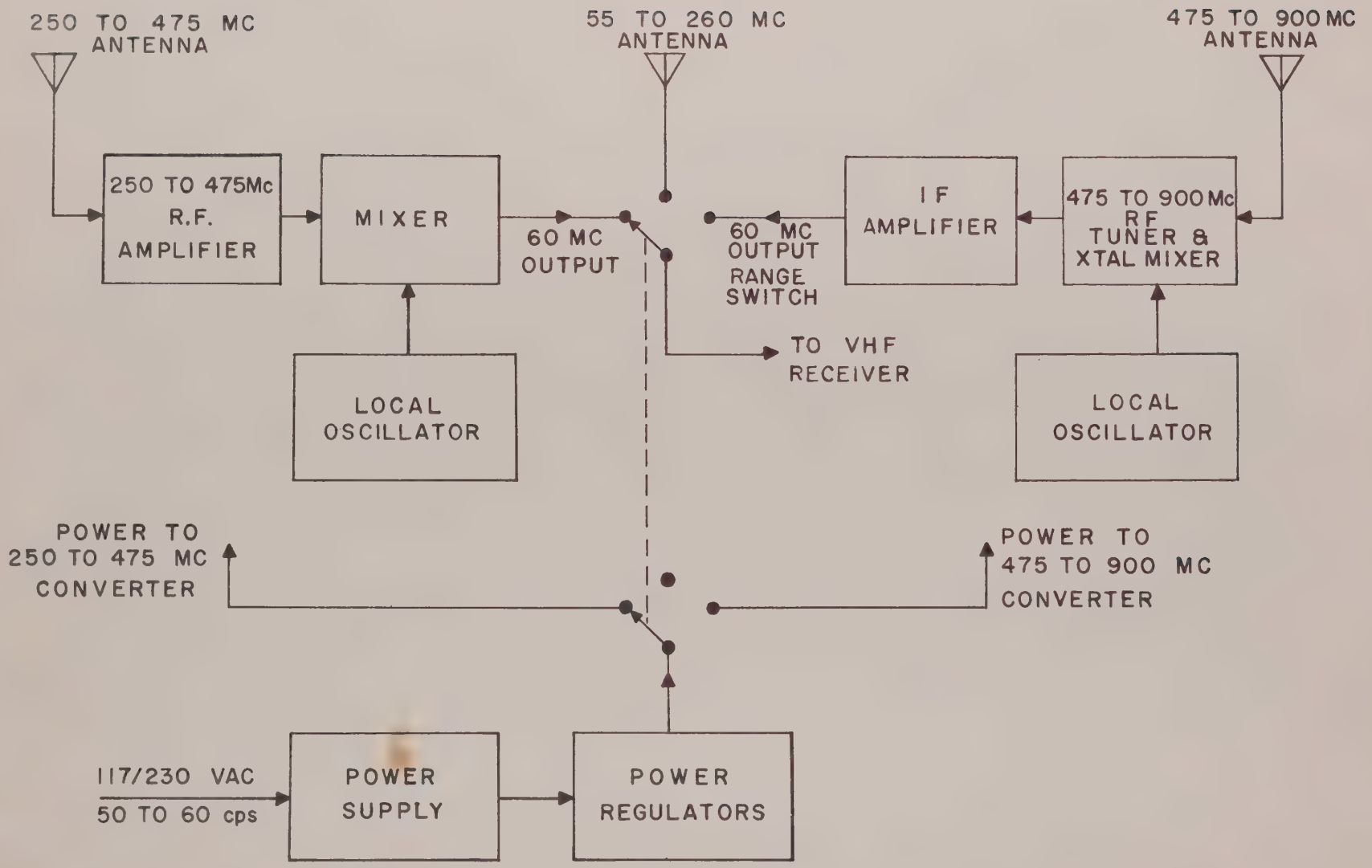


Fig. 2. Block Diagram REU-300 Range Extension Unit.

SECTION 2

THEORY OF OPERATION

1. ANALYSIS, MODEL REU-300.

a. A block diagram of the REU-300 Range Extension Unit is shown in Figure 2. The circuit with the "RANGE" switch in the 250 to 475 mc position is such that power is applied to the low-frequency RF section consisting of V-201, V-202, and V-203. With the "RANGE" switch in the "DIRECT" position, the circuit is such that the associated receiver gets its signal directly from the 55 to 260 mc antenna and operation is permitted in this range. With the "RANGE" switch in the 475 to 900 mc position, the circuit is such that power is applied to the high-frequency RF section consisting of V-102, V-105, and CR-105 and the system operates in the latter range.

2. DETAILED THEORY.

a. "RANGE" SWITCH IN 250 to 475 mc POSITION.

(1) Antenna.- The input impedance of the REU-300 with the "RANGE" switch in the 250 to 475 mc position is approximately 50 ohms over the tuning range. The input signal is fed through a type "N" coaxial receptacle, J-112, on the rear apron of the chassis.

(2) R.F. Amplifier, V-201, 5842/417A.- The input signal is applied to the cathode of the grounded-grid RF amplifier, V-201. The basic tuning element for the cathode of V-201 is one of four tuning sections of a Mallory UHF Inductuner, L-210A, which broadly resonates the cathode circuit to the frequency of the desired input signal. Cathode resistor method of obtaining self-bias is used in this circuit, resistor R-201 developing the bias, and capacitor C-214 providing cathode resistor by-passing. The plate circuit of the RF Amplifier, V-201, is capacitively coupled to the grid of the mixer, V-202, through a double tuned band-pass circuit, the basic tuning elements of which are two sections of the Mallory UHF inductuner, L-210B, and L-210C.

(3) Local Oscillator, V-203/6AF4A.- The local oscillator, V-203, which is a modified version of the Colpitts configuration, operates at a frequency of 60 mc above the signal input frequency to which the RF amplifier is tuned. Maximum oscillator stability is insured by the use of regulated B plus voltage for the oscillator plate circuit. The oscillator signal is injected into the mixer grid circuit through capacitor C-206, a 2.7 μμf capacitor, thus developing an operational mixer grid bias proportional to the amplitude of the local oscillator signal.

(4) Mixer, V-202/6AK5.- The mixer, V-202, receives the local oscillator injection voltage through C-206, and develops an operational grid bias across the grid resistors, R-204 and R-205. The R.F. signal from the double tuned band-pass circuit is coupled through capacitor C-205 to the grid of the mixer. A decoupled test point, from a tap on the mixer grid resistors, R-204 and R-205, provides a means of observing the response of the R.F. circuits and measuring the oscillator injection voltage.

Trimmers are incorporated in the R.F. plate, mixer input, and oscillator tank circuits for proper alignment and adjustment. The plate of the mixer, V-202, is tuned to 60 megacycles by L-204, a tunable series coil, and is coupled to the output across a capacitor, C-207, connected to the low R.F. potential end of L-204.

A blocking capacitor, C-219, 470 μμf is provided to prevent application of B_+ to the output circuit. The output is taken from J-202 through Coaxial Range Switch S-103, at 60 mc and applied to the Output jack, J-110 on the rear apron of the unit.

b. "RANGE" SWITCH IN THE "DIRECT" POSITION.

(1) With the coaxial range switch, S-103, in the "DIRECT" position the signal from the 55 to 260 mc antenna is applied to the input jack, J-108, and goes through the range switch, S-103, to the jack, J-110, on the rear apron of the unit, thus allowing the associated receiver to operate in the 55 to 260 mc range.

c. "RANGE" SWITCH IN THE 475 to 900 mc POSITION.

(1) Antenna.- The input impedance of the REU-300 with the "RANGE" switch in the 475 to 900 mc position is approximately 50 ohms over the tuning range. The input signal is fed through a type "N"coaxial receptacle, J-101, located on the rear apron of the unit.

(2) R.F. Section.- The REU-300 with the range switch in the 475 to 900 mc position employs a tuned two-cavity radio-frequency stage. The coaxial input jack, J-102, is coupled to the radio-frequency section, which is resonated to the input frequency by changing the capacitance between the inner conductor and the wall. This effectively produces quarterwave tuning in the cavities, and is analagous to the coaxial line cavity in which the resonant frequency is determined by the position of the plunger. The signal is then coupled through the inductor L-109 to the IN82-A crystal mixer stage.

(3) Local Oscillator V-105/6AF4A.- The local oscillator employs a type 6AF4A triode, V-105, and is tuned 60 mc higher than the input signal. Its tank circuit consists of a pair of transmission lines whose load is a variable capacitance ganged with the radio-frequency tuning capacitor. Minimum oscillator drift is achieved by employing three temperature-sensitive capacitors connected across the line at different points.

(4) Mixer, CR-105/IN82-A.- The radio-frequency signal and the local oscillator signal are coupled to the IN82-A mixer, CR-105, an RF crystal diode, the output circuit of which is tuned to 60 mc and is inductively coupled to the I.F. amplifier, V-102.

(5) I.F. Amplifier, V-102/6BN4.- The 6BN4 I.F. amplifier, V-102, receives its signal from the IN82-A mixer, CR-105, through an inductive coupling network, consisting of L-101, a coaxial cable, a coupling coil (L-102) and a tunable input coil (L-103). The I.F. amplifier is a single stage 6BN4 triode, V-102, utilizing a shunt coil, L-105, for neutralization of grid-to-plate capacitance. The plate of the I.F. amplifier, V-102, is tuned to 60 mc by L-104, a tunable series coil, and is coupled to the output

across C-103 which is connected to the low R.F. potential side of L-104. A blocking capacitor, C-104, is provided to prevent the application of B plus to the output circuit. The signal at 60 mc is then applied to the coaxial range switch and the output connector, J-110.

d. POWER SUPPLY.- The REU-300 has a conventional power supply featuring operation at both 117 and 230 volts input; this is facilitated by the use of a center-tapped primary on the power transformer, T-101. A full-wave bridge rectifier consisting of CR-101 through CR-104 is connected across terminals No. 4 and No. 5 of the power transformer, T-101. The pulsating dc from the rectifiers is fed to a conventional capacitor input filter for dc supply. The B plus supplied to the local oscillators is regulated by either V-101 or V-103, depending upon which range the unit is operating upon. The filament voltage of 6.3 volts a.c. is applied to all filaments upon operation of the power switch S-101, the B plus, however, is applied only to the unit in operation, thus preventing any possibility of interaction between the two circuits. The coaxial range switch, S-103, and switches S-104, S-105, S-106, and S-107 are ganged together in such a manner that the non-operative section is disabled; consequently, power is applied only to the illuminating lamp and associated circuitry of the section in use. In the event that neither section is used, as in the case when the "RANGE" switch is in the direct position, and the associated receiver is connected directly to its own antenna, power is applied to neither section, and the illuminating lamps behind both tuning dials are not lighted.

SECTION 3

INSTALLATION AND OPERATION

1. INTRODUCTION.

Figure 1 shows the location of the controls on the front panel of the REU-300. Figure 6 shows the location of controls and connectors on the rear apron of the equipment.

2. INSTALLATION.

a. Connect the 55 to 260 mc antenna through a 50 ohm transmission line to connector J-108 on the rear apron of the unit.

b. Connect the 250 to 475 mc antenna through a 50 ohm transmission line to connector J-112, on the rear apron of the unit.

c. Connect the 475 to 900 mc antenna through a 50 ohm transmission line to connector J-101 on the rear apron of the unit.

d. Connect the "OUTPUT" connector, J-110, through a 50 ohm transmission line to the input of the receiver to be used with the REU-300.

e. Place the 117/230 volt selector switch, S-102, in the appropriate position for the supply available.

f. Connect the power cord to jack J-111 on the rear apron, and apply 117/230 volts, 50 to 60 cps, single phase, alternating current.

3. OPERATION.

a. After the proper adjustments and connections have been made in accordance with the instructions above, place the "POWER" switch, S-101, located on the front panel, in the "ON" position. The REU-300 is now ready for operation.

b. Turn the "RANGE" switch to the position corresponding to the desired range of operation.

c. Tune the associated receiver to 60 mc (the output frequency of the REU-300).

d. Tune the REU-300 to the desired frequency of operation using the appropriate frequency selector knob and indicator dial.

SECTION 4

MAINTENANCE

1. INTRODUCTION.

The Model REU-300 has been fully aligned and factory tested before shipment and should give relatively trouble-free performance. In the event the unit appears to be unusually noisy, erratic, or to have unusually low sensitivity, check all R.F. coaxial connectors on the rear apron of the chassis. Should this fail to improve the operation of the unit, it is possible that a tube or crystal has become defective. Tube checking, or comparison of the voltages present in the unit with those indicated in the Tube Socket Voltage Chart will aid in locating defective tubes. Only a limited number of components may be replaced in the R.F. and I.F. sections of the REU-300 without disturbing critically tuned circuits. When replacing such components, it is imperative that the new components have leads of identical length with those of the old components and that the physical location and arrangement of all other components and leads not be disturbed. In the event that it becomes absolutely essential to realign the REU-300, refer to the following procedure:

2. ALIGNMENT OF 475 to 900 MC SECTION.

a. General.- The 60 mc I.F. signal from the IN82-A crystal mixer, CR-105, in the R.F. tuning unit is coupled to the grid of a neutralized 6BN4 grounded-cathode triode, V-102, for amplification. The neutralization of grid-to-plate capacitance is accomplished by a tunable coil (L-105), in shunt with this capacitance. Both grid input coil L-103, and plate coil L-104, are shielded to prevent stray coupling from other components. The following steps are to be followed in sequence for I.F. alignment:

b. I.F. Alignment.-

(1) Using a 50 ohm cable, connect the output of the REU-300 to any receiver which can be tuned to 60 megacycles and is equipped with an input signal level indicating device.

(2) Place the "RANGE" switch in the 475 to 900 mc position.

(3) Unsolder the 68 K ohm resistor, R-102, from feed-thru capacitor, C-108, on top of the chassis, and connect a bias voltage to C-108, which can be varied from 0 to minus 15 volts.

(4) Ground the feed-thru capacitor, C-109, from the top of the chassis.

(5) Disconnect P-104 from J-104 and feed 60 mc CW into J-104 from an accurately calibrated signal generator.

(6) Steadily increase the output from the 60 mc signal generator and the bias voltage simultaneously so as to maintain the output at a constant reference level until the 6BN4 is biased beyond cut-off, as the output will not drop any further with any increase of bias voltage.

(7) Adjust the neutralization coil, L-105, for minimum output.

(8) Steadily decrease the signal generator output and the bias voltage simultaneously to maintain the output at the original reference level until the bias voltage is brought back to the minus 1.0 volt level.

(9) Adjust the plate coil, L-104, for maximum output.

(10) Disconnect the input from the signal generator and reconnect P-104 to J-104.

(11) Remove the bias supply, and remove the ground from the feed-thru capacitor, C-109.

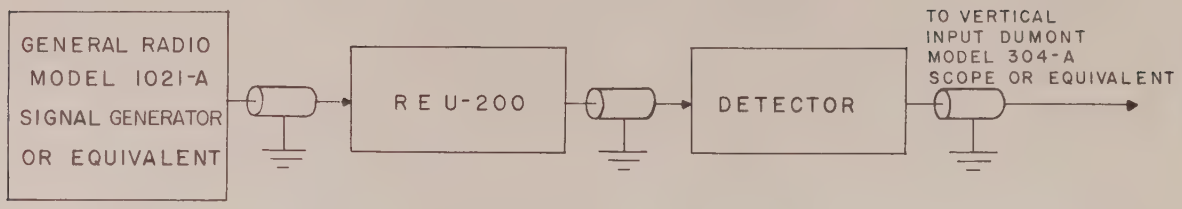
(12) Resolder the 68 K ohm resistor, R-102, to capacitor C-108.

(13) Connect the output of a UHF signal generator to the antenna input jack, J-101. Set both the signal generator and high-frequency tuning dial to approximately 800 mc. Adjust L-103 for maximum output. Keep the signal generator at a low output level to avoid possible damage to the mixer crystal.

(14) This completes the I.F. alignment of the high-frequency section.

c. R. F. Alignment.- Under no circumstances should any adjustments be made in the R.F. section of the R.F. unit. These circuits have been carefully aligned at the factory and should require no further adjustments.

BLOCK DIAGRAM FOR LOCAL OSCILLATOR ADJUSTMENT.



DETECTOR SCHEMATIC DIAGRAM

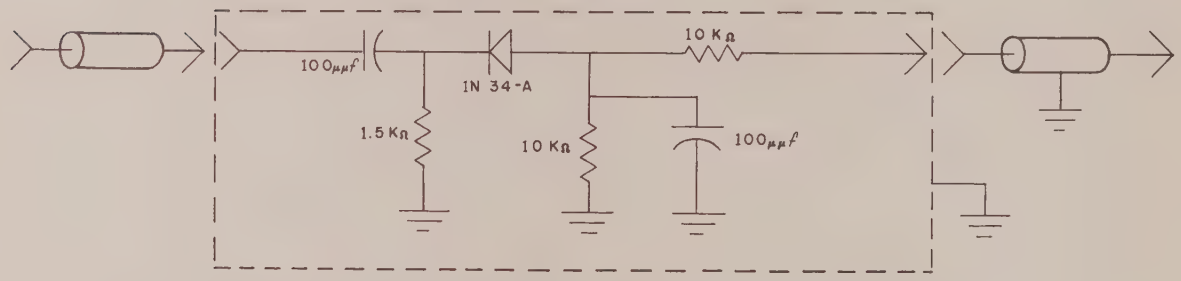


Fig. 3. Block Diagram and Detector Schematic for Local Oscillator Adjustment, 475 to 900 mc Section.

d. Local Oscillator Adjustment.- Replacement of the 6AF4 oscillator tube affects tracking and sensitivity. The variation in performance with different tubes installed is due to small variations in tube characteristics. If unable to restore satisfactory performance by substituting tubes, install a new tube and align the oscillator circuit in the following manner:

(1) Connect the test equipment as shown in Figure 3.

(2) Set the UHF signal generator to 960 mc (if a VHF signal generator is used, set it at 480 mc for 2nd harmonic use, or 320 mc if the third harmonic is to be used). The signal generator should be calibrated for high accuracy.

(3) Set the high-frequency tuning dial at 900 mc. Using a nonmetallic insulated screw-driver, adjust the trimmer capacitor, C-119, to produce zero beat as indicated on the oscilloscope. Limit signal generator output to just enough to produce zero beat. A large signal generator output may cause the local oscillator to "pull" and may damage the mixer crystal. As a starting point, vary the frequency of the signal generator to determine initial oscillator frequency.

(4) Set the UHF signal generator to 535 mc (if a VHF signal generator is used, set to 267.5 mc for second harmonic use). Again calibrate the signal generator for high frequency accuracy.

(5) Set the dial of the REU-300 at 475 mc. Use a nonmetallic insulated screw-driver to adjust the trimmer, C-123, for zero beat.

(6) This completes the adjustment of the local oscillator for the high-frequency section.

3. ALIGNMENT OF 250 to 475 MC SECTION.

a. Mixer.

(1) Connect the output of the REU-300 to a VHF receiver which is equipped with an input signal strength meter.

(2) Feed a 60 mc. C.W. signal from a signal generator to the grid of the 6AK5 mixer, V-202, through the tie-point, TP-101, located on the top of the R.F. sub-chassis.

(3) Tune the output coil, L-204, for maximum output as indicated on the VHF receiver signal strength meter.

b. Local Oscillator Adjustment.

(1) Local oscillator adjustment is limited to correcting the reading of the tuning dial, if it is found to be in error. The replacement of a tube may produce an error, and this may be corrected for by adjusting C-213. The adjustment should be made with a signal generator with a high degree of accuracy at 475 mc.

(2) The low-frequency end of the dial is controlled by the inductance of L-206. The correct adjustment has been made at the factory, and should not require readjustment in the field.

c. R.F. Alignment.

The R.F. circuits are wide band and are designed around a modified Mallory four-section UHF inductuner. If realignment becomes necessary, proceed as follows:

(1) Connect a sweep generator with a 50 Ω source impedance to the 250-475 mc. antenna input coaxial connector, J-101.

(2) Connect a high gain oscilloscope to test point TP-101.

(3) Set the tuning dial for 300 mc.

(4) Adjust C-211 and C-212 for a double tuned symmetrical response centered around 300 mc. NOTE: The R.F. response at the high-frequency end is controlled by fixed inductances and adjustments should not be attempted in the field.

TABLE 3

TUBE SOCKET VOLTAGE CHART

FOR

MODEL REU-300

RANGE EXTENSION UNIT

TUBE	TYPE	1	2	3	4	5	6	7	8	9
V-101	OA2	150V	Gnd.	NC	NC	150V	NC	NC		
V-102	6BN4	+1.0V*	or	Gnd.	6.3Vac	111V	+1.0V*			
V-103	OA2	150V	Gnd.	NC	NC	150V	NC	NC		
V-104	Amp. (3-4)	NC	13.4 VAC	NC	NC	NC	NC	6.8VAC		
V-105	6AF4A	+60V*	-3.5V*	6.3VAC	Gnd.	Gnd.	-3.5V*	+60V*		
V-201	5842	148V	Gnd.	Gnd.	Gnd.	Gnd.	+1.6V	Gnd.	Gnd.	6.3 VAC
V-202	6AK5	-1.4V	Gnd.	6.3Vac	Gnd.	145V	43V	Gnd.		
V-203	6AF4A	78V	-5.7V	6.3Vac	0	0	-5.7V*	80V		

NOTES:

* 1. DC voltages measured on V-105 and all DC voltages marked with (*) were measured with a 1 meg resistor in series with VTVM probe.

2. Voltage taken with respect to chassis ground.

3. Input line voltage was 117V, 60 cps.

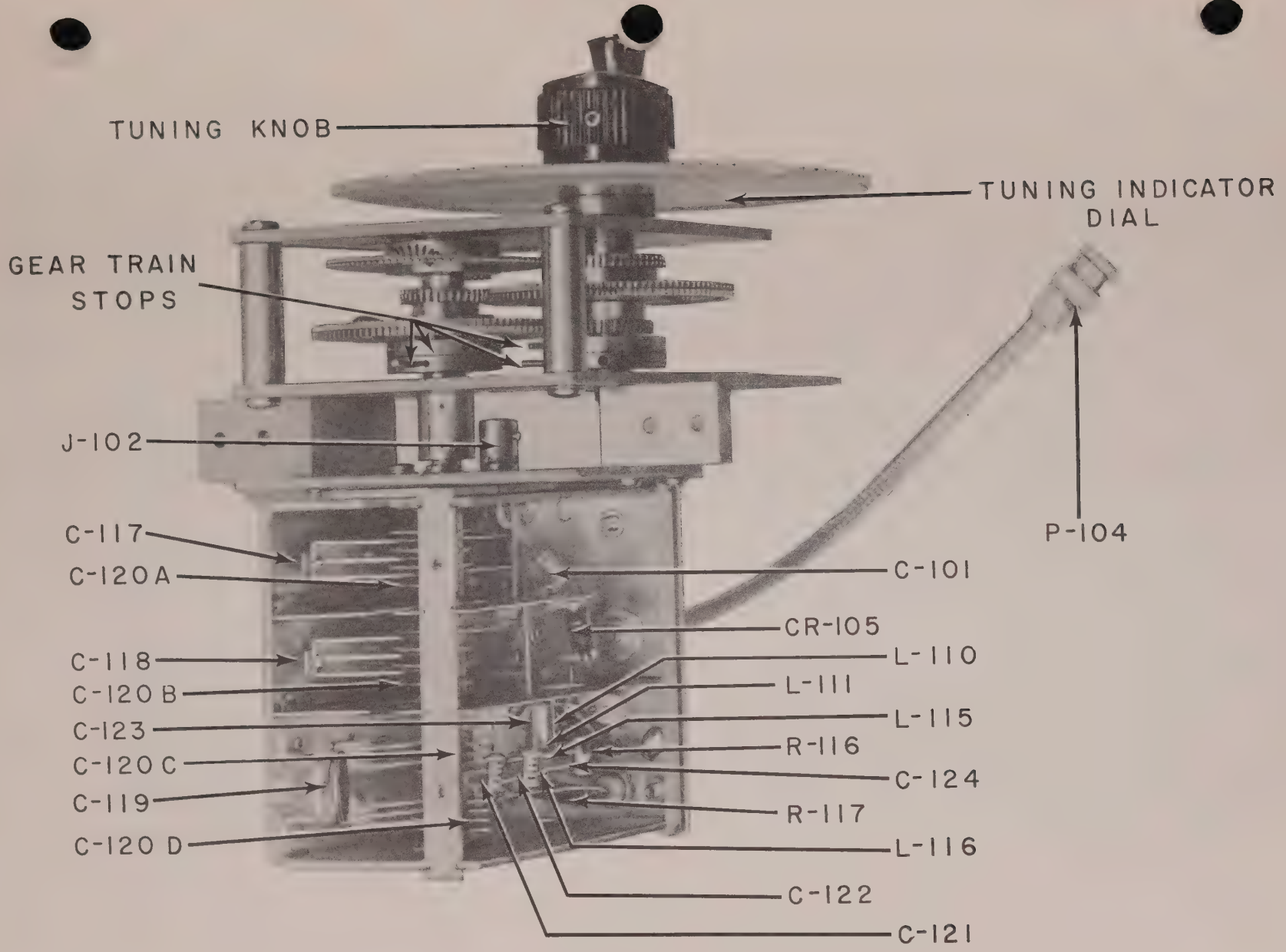


Fig. 4. 475 to 900 mc R.F. Section, Bottom View, Covers Removed.

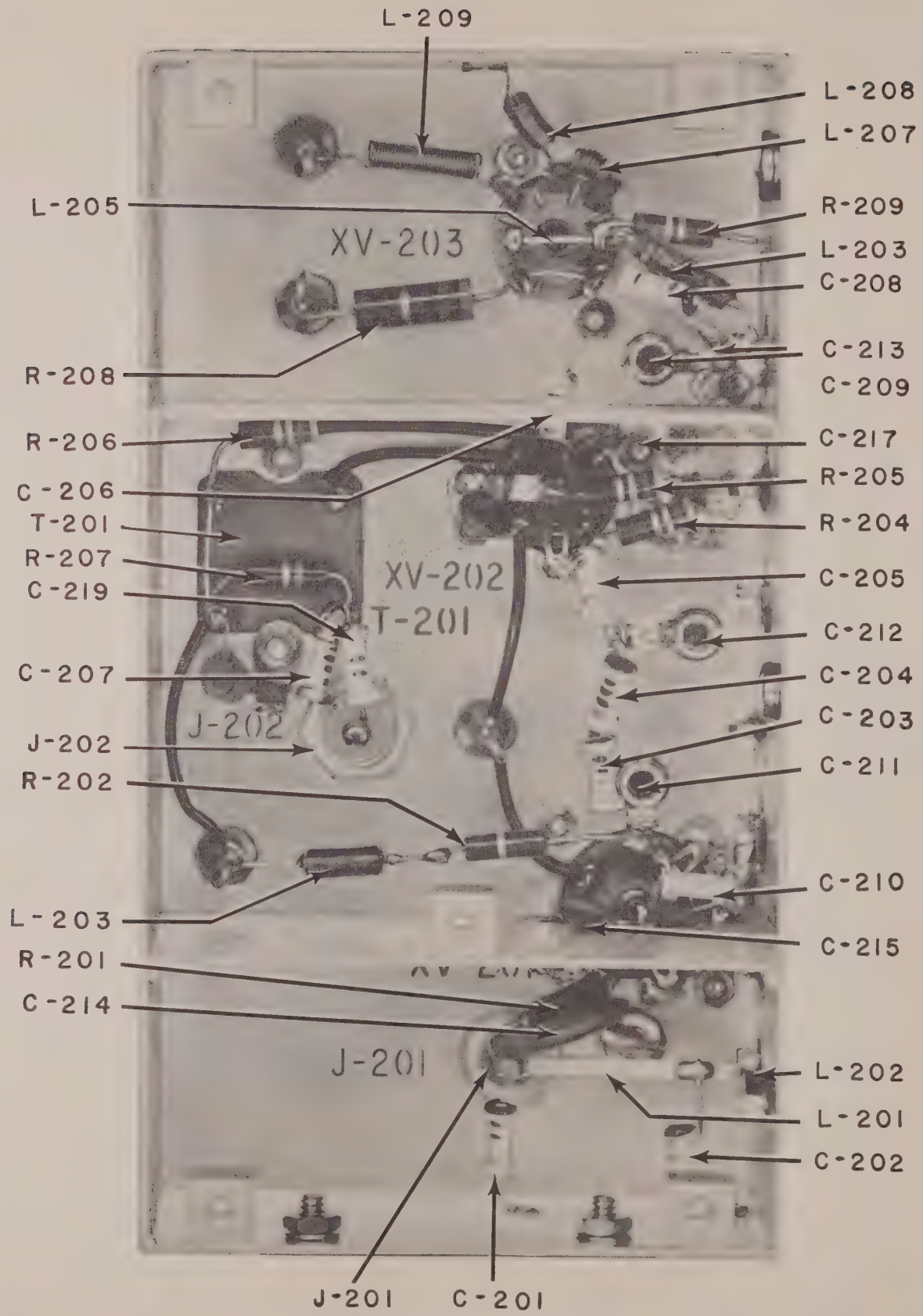


Fig. 5. 250 to 475 mc R.F. Section, Bottom View, Dust Cover Removed.

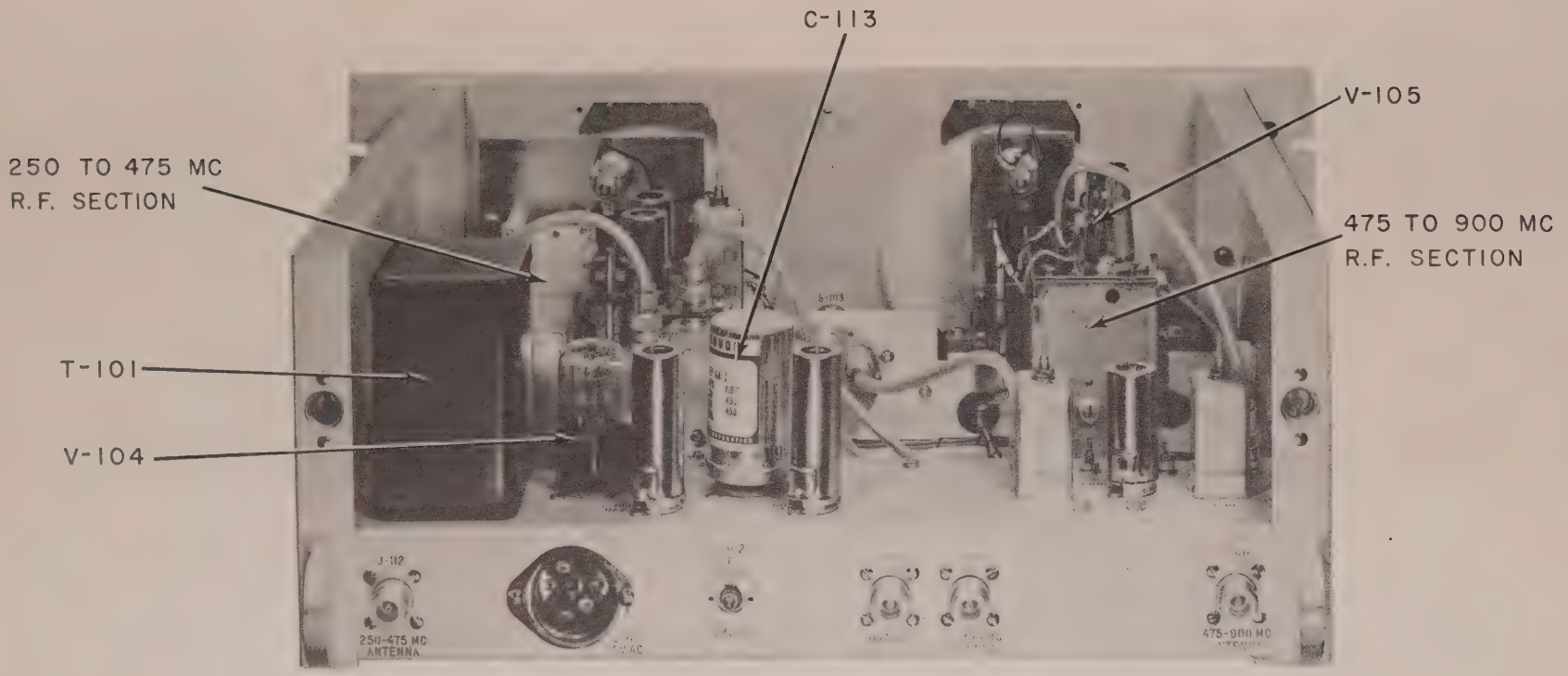


Fig. 6. REU-300 Main Chassis, Rear View, Dust Cover Removed.

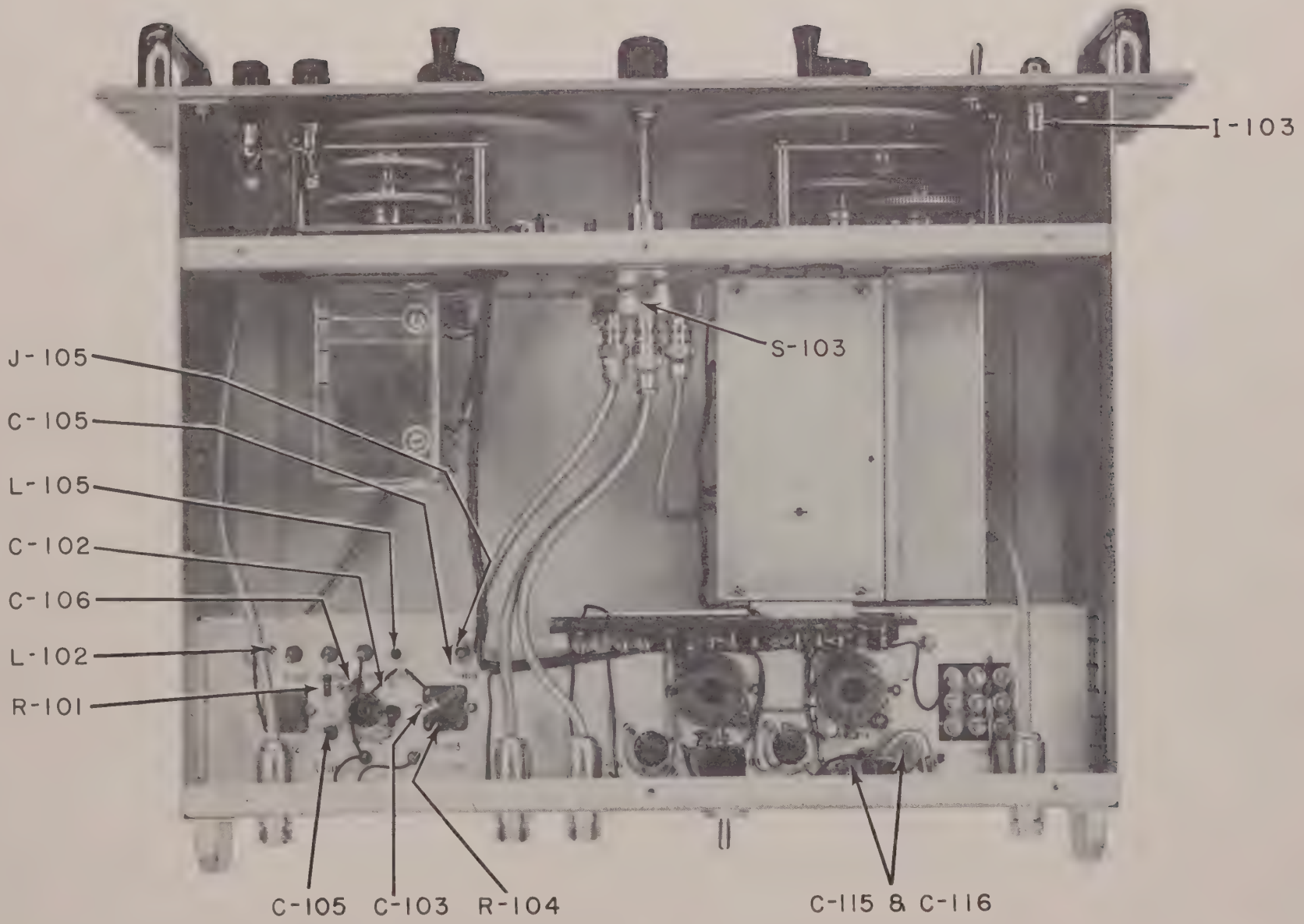


Fig. 7. REU-300 Main Chassis, Bottom View, Dust Cover Removed.

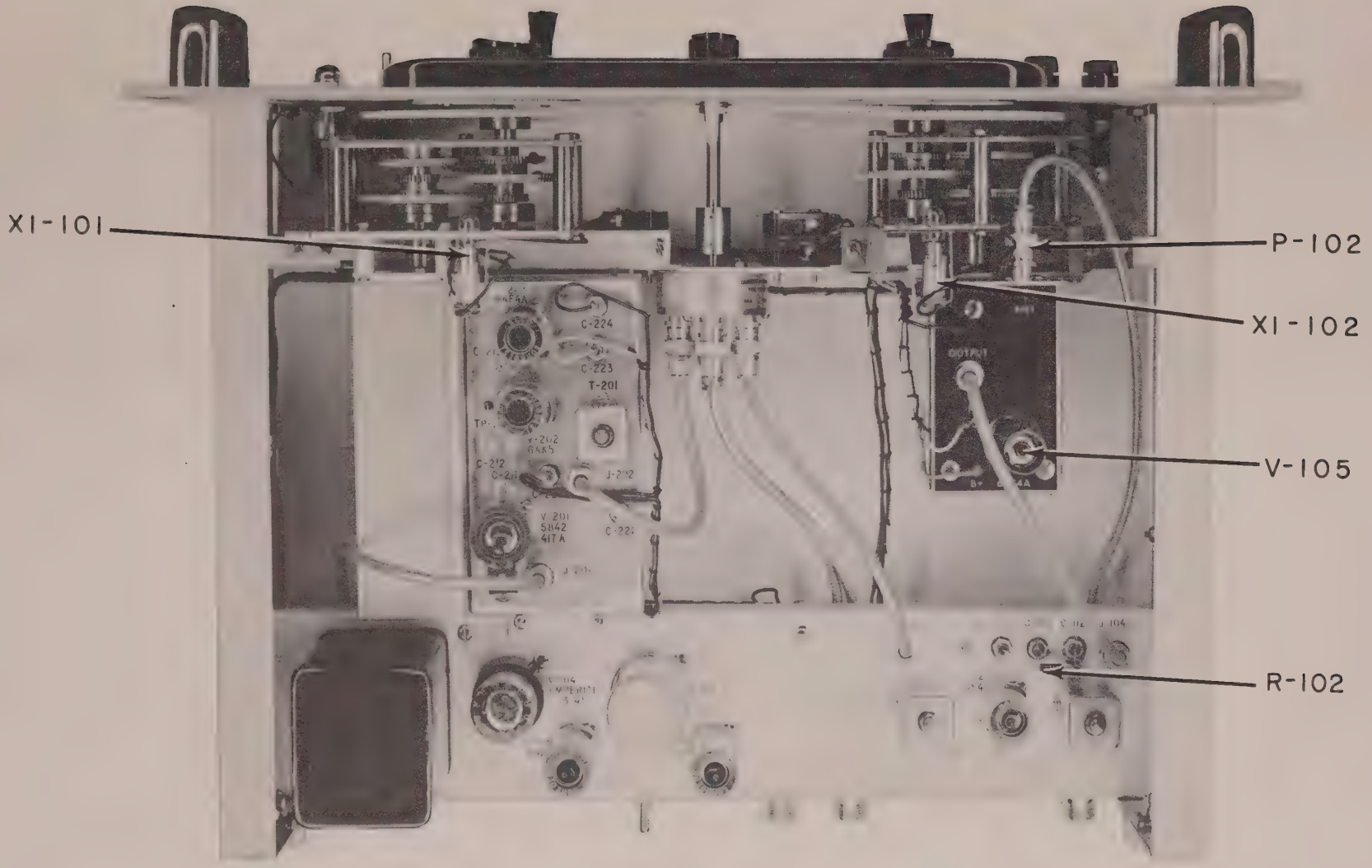


Fig. 8. REU-300 Main Chassis, Top View, Dust Cover Removed.

SECTION 5

PARTS LIST REU-300

RANGE EXTENSION UNIT

When ordering replacement parts, give the equipment name and model number, and the symbol number and description of each item ordered.

Replacement parts which will be supplied against an order may not be exact duplicates of the original parts. However, only minor differences in the electrical or mechanical characteristics will be involved, and, consequently, will in no way impair the operation of the equipment.

SECTION 5

PARTS LIST

REU-300

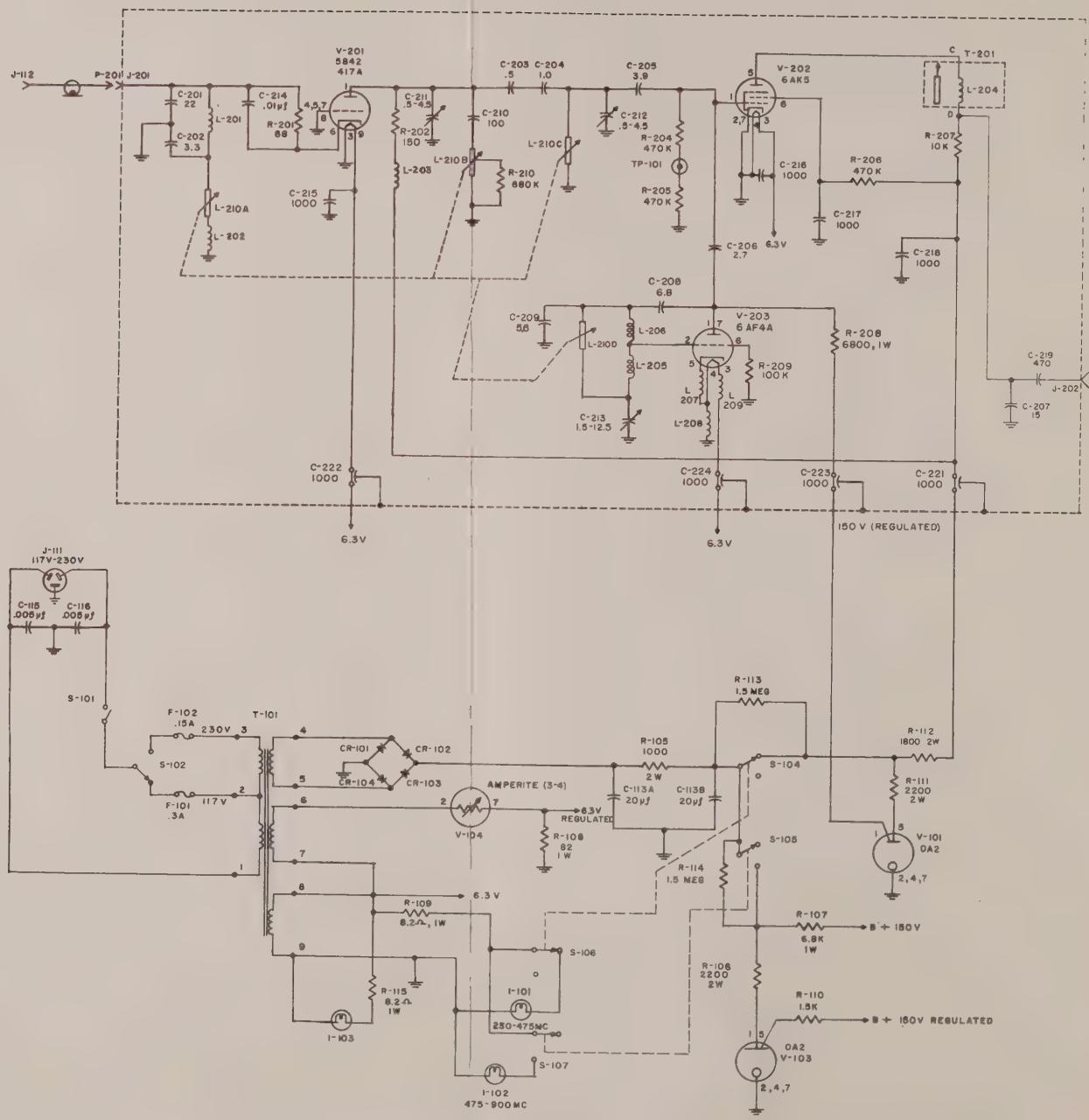
Symbol Number	Name of Part and Description
C-101	CAPACITOR, CERAMIC, UNINSULATED: 1.5 μμf, ±5%, 500 WVDC, Erie #NPO-A.
C-102	CAPACITOR, CERAMIC, INSULATED: 470 μμf, ±10%, 500 WVDC, Erie #GP2-A.
C-103	Same as C-101.
C-104	Same as C-102.
C-105	CAPACITOR, CERAMIC, DISC: .001 μf, 500 WVDC, Sprague #40C214.
C-106	Same as C-105.
C-107	CAPACITOR, CERAMIC, FEEDTHRU: .001 μf, 500 WVDC, Sprague #514C1.
C-108	Same as C-107.
C-109	Same as C-105.
C-110	CAPACITOR, CERAMIC, BUTTON: .001 μf, 500 WVDC, Sprague #507C2.
C-111	Same as C-110.
C-112	CAPACITOR, CERAMIC, FEEDTHRU: .47 μμf, 500 WVDC, Sprague #514C11A.
C-113 A&B	CAPACITOR, PAPER, 2 SECTION: 20-20 μfd, 450 WVDC, Aerovox #AEP44J.
C-114	Not used.
C-115	CAPACITOR, CERAMIC, DISC: .005 μf, 1400 WVDC, Radio Materials #Type U.
C-116	Same as C-115.
C-201	CAPACITOR, CERAMIC, UNINSULATED: 2.2 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-202	CAPACITOR, CERAMIC, UNINSULATED: 3.3 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-203	CAPACITOR, CERAMIC, UNINSULATED: .5 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-204	CAPACITOR, CERAMIC, UNINSULATED: 1 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-205	CAPACITOR, CERAMIC, UNINSULATED: 3.9 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-206	CAPACITOR, CERAMIC, UNINSULATED: 2.7 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-207	Same as C-101.
C-208	CAPACITOR, CERAMIC, UNINSULATED: 6.8 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-209	CAPACITOR, CERAMIC, UNINSULATED: 5.6 μμf ±.25 μμf, 500 WVDC, Erie #NPO-A.
C-210	CAPACITOR, CERAMIC, UNINSULATED: 100 μμf ±10%, 500 WVDC, Erie #N1400-A.
C-211	CAPACITOR, CERAMIC, TRIMMER: 0.5-4.5 μμf ±10%, 500 WVDC, Cambridge Thermionic, #CST-6.
C-212	Same as C-211.
C-213	CAPACITOR, CERAMIC, TRIMMER: 1.5-12.5 μμf, 500 WVDC, Cambridge Thermionic #CST-50.

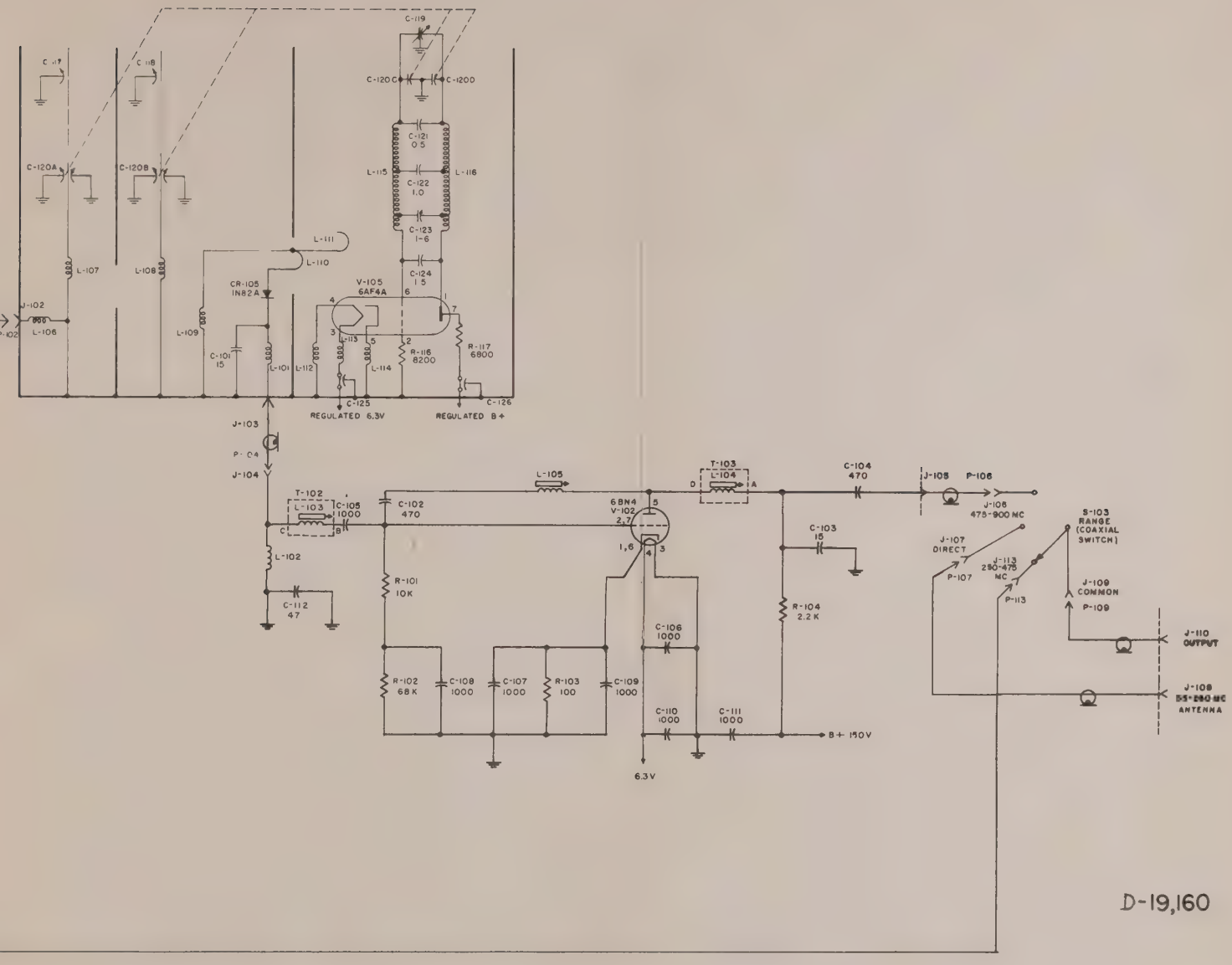
Symbol Number	Name of Part and Description
C-214	CAPACITOR, CERAMIC, DISC: .01 μf, 500 WVDC, Sprague #29C9BB(44C1).
C-215	Same as C-105.
C-216	Same as C-105.
C-217	Same as C-105.
C-218	Same as C-105.
C-219	Same as C-102.
C-220	Not used.
C-221	Same as C-107.
C-222	Same as C-107.
C-223	Same as C-107.
C-224	Same as C-107.
CR-101	RECTIFIER, DIODE, SILICON: IN539, G.E. IN539.
CR-102	Same as CR-101.
CR-103	Same as CR-101.
CR-104	Same as CR-101.
F-101	FUSE, SLO-BLO: 0.3 amp, Bussman #MDL.
F-102	FUSE, SLO-BLO: .15 amp, Bussman #MDL.
I-101	LAMP, INCANDESCENT: 6-8V, minimum bayonet base, G.E. #47.
I-102	Same as I-101.
I-103	Same as I-101.
J-101	CONNECTOR, RECEPTACLE: UG-1052/U.
J-102	CONNECTOR, RECEPTACLE: UG-290/U, Modified.
J-103	CONNECTOR, RECEPTACLE: MX-1684/U, IPC #1025.
J-104	CONNECTOR, RECEPTACLE: UG-625B/U.
J-105	Same as J-103.
J-106	Part of S-103.
J-107	Part of S-103.
J-108	Same as J-101.
J-109	Part of S-103.
J-110	Same as J-101.

Symbol Number	Name of Part and Description
J-111	CONNECTOR, RECEPTACLE: A.C. Power connection, Hubbell #7486.
J-112	Same as J-101.
J-113	Part of S-103.
L-101	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. #A-18,455.
L-102	Same as L-101.
L-103	Part of T-102, not separately replaceable.
L-104	Part of T-103, not separately replaceable.
L-105	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. A-18,454.
L-201	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. A-18,969.
L-202	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. A-18,970.
L-203	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. A-18,974.
L-204	INDUCTOR: Part of T-201, not separately replaceable.
L-205	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. A-18,971.
L-206	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. A-18,973.
L-207	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. #A-18,972-1.
L-208	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. #A-18,972-2.
L-209	INDUCTOR: coil, per NEMS-CLARKE Co. Dwg. #A-18,972-3.
L-210 A	INDUCTUNER, 4 SECTION, UHF: Mallory # 60-50309.
B	Part of L-210.
C	Part of L-210.
D	Part of L-210.
P-101	CONNECTOR, PLUG: Type UG-536 A/U.
P-102	CONNECTOR, PLUG: Type UG-88/U.
P-103	Not used.
P-104	Same as P-102.
P-105	Not used.
P-106	Same as P-102.
P-107	Same as P-102.
P-108	Same as P-101
P-109	Same as P-102.

Symbol Number	Name of Part and Description
P-110	Same as P-101.
P-111	CONNECTOR, PLUG: Hubbell #7484.
P-112	Same as P-101.
P-113	Same as P-102.
R-101	RESISTOR, FIXED, COMPOSITION: 10K ±5%, 1/2W, Allen Bradley.
R-102	RESISTOR, FIXED, COMPOSITION: 68K ±5%, 1/2W, Allen Bradley.
R-103	RESISTOR, FIXED, COMPOSITION: 100 ohms ±5%, 1/2W, Allen Bradley.
R-104	RESISTOR, FIXED, COMPOSITION: 2.2K ±5%, 1/2W, Allen Bradley.
R-105	RESISTOR, FIXED, COMPOSITION: 1K ±5%, 2W, Allen Bradley.
R-106	RESISTOR, FIXED, COMPOSITION: 2.2K ±5%, 2W, Allen Bradley.
R-107	RESISTOR, FIXED, COMPOSITION: 6.8K ±5%, 1W, Allen Bradley.
R-108	RESISTOR, FIXED, COMPOSITION: 82 ohms ±5%, 2W, Allen Bradley.
R-109	RESISTOR, FIXED, COMPOSITION: 8.2 ohms ±10%, 1W, Allen Bradley.
R-110	RESISTOR, FIXED, COMPOSITION: 1.5K ±10%, 1/2W, Allen Bradley.
R-111	Same as R-106.
R-112	RESISTOR, FIXED, COMPOSITION: 1.8K ±5%, 2W, Allen Bradley.
R-113	RESISTOR, FIXED, COMPOSITION: 1.5 Meg ±5%, 1/2W, Allen Bradley.
R-114	Same as R-113.
R-115	Same as R-109.
R-201	RESISTOR, FIXED, COMPOSITION: 68 ohms ±5%, 1/2W, Allen Bradley.
R-202	RESISTOR, FIXED, COMPOSITION: 150 ohms ±10%, 1/2W, Allen Bradley.
R-203	Not used.
R-204	RESISTOR, FIXED, COMPOSITION: 470K ±10%, 1/2W, Allen Bradley.
R-205	Same as R-204.
R-206	Same as R-204.
R-207	Same as R-101.
R-208	Same as R-107.
R-209	RESISTOR, FIXED, COMPOSITION: 100K ±10%, 1/2W, Allen Bradley.
R-210	RESISTOR, FIXED, COMPOSITION: 680K ±5%, 1/2W, Allen Bradley.
S-101	SWITCH: TOGGLE: SPST, H.H. Smith #520.

Symbol Number	Name of Part and Description
S-102	SWITCH: TOGGLE: SPDT, H.H. Smith #521.
S-103	SWITCH, COAXIAL: Danbury-Knudsen #CS-1030.
S-104	SWITCH, ROTARY: 3 pole, 2 position, Microswitch #V3-101.
S-105	Same as S-104.
S-106	Same as S-104.
S-107	Same as S-104.
T-101	TRANSFORMER, POWER: NEMS-CLARKE Co. Dwg. #AB-19162.
T-102	INDUCTOR, VARIABLE: per NEMS-CLARKE Co. Dwg. AB-18,386.
T-103	INDUCTOR, VARIABLE: per NEMS-CLARKE Co. Dwg. AB-18,387.
V-101	TUBE, ELECTRON: OA2.
V-102	TUBE, ELECTRON: 6BN4.
V-103	Same as V-101.
V-104	TUBE, BALLAST: Amperite #(3-4).
V-105	TUBE, ELECTRON: 6AF4A.
V-201	TUBE, ELECTRON: Western Electric #5842/417A.
V-202	TUBE, ELECTRON: 6AK5.
V-203	Same as V-105.
W-101	CORD, POWER: Cornish #3509.
XF-101	FUSEHOLDER: Bussman type #HKP.
XF-102	Same as XF-101.
XI-101	LAMP, ASSEMBLY: miniature bayonet base, type 236U32A4. Drake #219.
XI-102	Same as XI-101.
XI-103	LAMP, ASSEMBLY: miniature bayonet base, red lens, Dialco #81-410-112.
XV-101	SOCKET, TUBE: 7 pin miniature, Elco #BR-151-BC.125.
XV-102	Same as XV-101.
XV-103	Same as XV-101.
XV-104	SOCKET, TUBE: octal, type TS101P01.
XV-201	SOCKET, TUBE: 9 pin miniature, Mycalex #90A299.
XV-202	SOCKET, TUBE: 7 pin miniature, Mycalex #70A403.
XV-203	SOCKET, TUBE: 7 pin miniature, type TS102P01, Mycalex.


J-112
P-201
J-201
C-201 22
C-202 3.3
L-201
C-214 .01μf
R-201 68
V-201 5842 417A
C-211 .5-4.5
R-202 150
L-203
C-210 100
L-210A
L-202
L-210B
R-210 680K
C-215 1000
C-203 .5
C-204 1.0
C-205 3.9
L-210C
C-212 .5-4.5
R-204 470K
TP-101
R-205 470K
V-202 6AK5
C-216 1000
C-206 2.7
6.3V
R-206 470K
C-217 1000
C-218 1000
T-201
L-204
R-207 10K
C-208 6.8
C-209 5.6
L-2100
L-206
L-205
V-203 6AF4A
R-208 6800, 1W
R-209 100K
L 207
L 209
L-208
C-213 1.5-12.5
C-219 470
C-207 .5
J-202
P-202
C-222 1000
C-224 1000
C-223 1000
C-221 1000
6.3V
6.3V
150 V (REGULATED)
J-111 117V-230V
C-115 .005μf
C-116 .005μf
S-101
F-102 .15A
230V
S-102
F-101 .3A
117V
T-101
CR-101
CR-102
CR-104
CR-103
AMPERITE (3-4)
V-104
6.3V REGULATED
R-108 82 1W
R-105 1000 2W
C-113A 20μf
C-113B 20μf
R-113 1.5 MEG
S-104
R-112 1800 2W
R-111 2200 2W
V-101 0A2
2,4,7
S-105
R-114 1.5 MEG
6.3 V
R-109 8.2Ω, 1W
S-106
R-115 8.2Ω 1W
I-101
I-103
250-475MC
S-107
I-102 475-900MC
R-107 6.8K 1W
B + 150V
R-106 2200 2W
R-110 1.5K
B + 150V REGULATED
0A2 V-103
2,4,7



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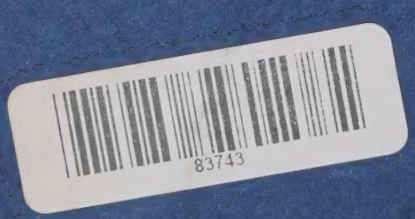
NOTES:

1. ALL RESISTORS ARE IN OHMS & 1/2 RATING & ALL CAPACITORS ARE IN MMFD UNLESS OTHERWISE SPECIFIED.
2. WHEN S-103 IS IN 250-475 POSITION, S-104 & S-106 ARE CLOSED.
3. WHEN S-103 IS IN DIRECT POSITION, S-104, 105, 106, & 107 ARE OPEN.
4. WHEN S-103 IS IN 475-900 POSITION, S-105 & S-107 ARE CLOSED.

Fig. 9. Schematic Diagram, REU-300 Range Extension Unit.

Oxford
ESSELTE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